Claims

What is claimed is:

1.   A method of defining and applying rules to rate an event, comprising:

receiving rules in a spreadsheet format;

extracting the rules from the spreadsheet format; and

applying the rules to available inputs regarding the event to generate required results.

2.   The method of claim 1, further comprising converting the extracted rules to a form enabling rapid execution.

3.   The method of claim 1, further comprising,

presenting a partially populated spreadsheet to a rule author; and

receiving a fully populated spreadsheet from the rule author.

4.   The method of claim 1, wherein the extracting step comprises:

constructing a table with an entry for each cell defined in the spreadsheet;

compiling the rules from the spreadsheet; and

storing a final execution sequence for the rules.

5.   The method of claim 4, wherein the final execution sequence is stored in an intermediate form.

6.   The method of claim 5, wherein the intermediate form is executable machine code.

7.   The method of claim 4, wherein the compiling step comprises:

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type-checking values for the available inputs;

building a dependency graph for the cells;

checking for cycles;

discarding cells in the dependency graph that are unreachable;

performing a topological sort for the cells;

type-checking the cells;

type-checking values for the required results;

discarding cells corresponding to values for available inputs; and

performing constant expression evaluation.

8. The method of claim 1, wherein the applying step further comprises:

creating a table whose entries map names of cell in the spreadsheet to values;

initializing the table with values for the available inputs;

evaluating the cells in an order specified by an execution sequence; and

determining values of the required results by extracting values of cells associated with the required results from the table.

9. The method of claim 8, wherein the evaluating step comprises:

adding a constant to the table if the cell specifies a constant, or evaluating an expression tree using values already in the table if the cell specifies a formula.

10. A method of generating rules used to rate an event, comprising:

identifying characteristics of input usage records, supplemental data, and required results for the event;

identifying available inputs for rating the event from the characteristics of the input usage records and the supplemental data;

presenting a rule author with an option to select one or more available inputs to be processed by the rules; and

receiving the rules created based upon the available inputs.

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11. The method of claim 10, wherein the rules define the required results based on the available inputs.

12. The method of claim 10, further comprising presenting a spreadsheet interface to a rule author to create the rules.

13. The method of claim 12, further comprising extracting the rules from the spreadsheet format.

14. The method of claim 12, wherein the spreadsheet is partially initialized.

15. The method of claim 10, wherein the available inputs are derived from usage data regarding the event.

16. The method of claim 10, wherein the available inputs are derived from supplemental data sources.

17. The method of claim 10, wherein the required results include information necessary to generate a bill for the event.

18. The method of claim 12, wherein the spreadsheet is partially initialized with test values for at least some of the available inputs.

19. The method of claim 18, further comprising providing functionality to dynamically test the rules using native functions of the spreadsheet.

20. The method of claim 10, further comprising:
      identifying supplemental data affected by the required results; and
      automatically updating the affected supplemental data based on the required results.

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21.   The method of claim 20, wherein the updating step comprises:

linking the affected supplemental data to the associated required results;

forwarding the associated required results to a database storing the affected

supplemental data upon production of the associated required results; and

modifying the affected supplemental data based on the associated required results.

22.   A method of defining rules for rating an event, comprising:

identifying information available about the event;

initializing a spreadsheet with the available information;

presenting the spreadsheet to a rule author;

receiving a populated spreadsheet defining rules;

extracting the rules from the populated spreadsheet; and

storing the rules.

23.   The method of claim 22, further comprising

receiving event information regarding the occurrence of the event; and

applying the rules to the event to generate results.

24.   The method of claim 22, wherein the rules are applied upon receipt of information
that the event has occurred.

25.   The method of claim 22, wherein the rules define required results based on the
available information.

26.   The method of claim 25, wherein the required results include billing information.

27.   The method of claim 26, further comprising forwarding the required results to a
bill processor.

28.   The method of claim 22, further comprising maintaining knowledge of the state of external data sets which are affected by rule execution, without the necessity to repeatedly query those external data sets.

29.   The method of claim 23, further comprising:
        identifying data affected by the results; and
        automatically updating the data upon production of the results.

30.   A computer useable information storage medium storing computer readable program code means for causing a computer to perform the steps of:
        receiving rules in a spreadsheet format;
        extracting the rules from the spreadsheet format; and
        applying the rules to available inputs regarding the event to generate required results.

31.   An apparatus for rating events, comprising:
        a definition module for creating rules that define required results based on available inputs;
        means for extracting the rules from the price definition module; and
        means for applying the rules to an event to rate the event.

32.   The apparatus according to claim 31, wherein the price definition module includes a spreadsheet interface.

33.   The apparatus according to claim 31, further comprising means for identifying input usage records, supplemental data, and required results for the event and means for presenting selected ones of the input usage records and the supplemental data to a rule author via the spreadsheet interface.

34.   The apparatus according to claim 32, further comprising means for dynamically testing the rules using native functions of the spreadsheet interface.